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ABSTRACT

Fundamental to any critical reading process is the ability of the child to recognize and identify assumptions concerning the world in which he or she lives and brings to the printed page. The unconscious and implicit understandings that a reader and an author hold can fill the slots of developing schemata and become embedded and subsumed in preexisting schematic representations. It becomes imperative, therefore, to teach critical reading skills to gifted children early, before these high-level schemata are formed and brought to bear on the printed page. Once high-level schemata have developed, it becomes more difficult to change existing schematic representations or provide for the flexibility of thought needed to access other possible interpretations of the same passage. Thus, the teacher's role should involve the development of an instructional setting in which students become consciously aware of the assumptions underlying the mental schemata operating upon their organization and interpretation of written information. The use of an externally based, student-centered outline format may facilitate the conscious uncovering of implicit assumptions used in a line of reasoning while at the same time providing a structure within which students can analyze biasing and emotionally loaded statements and arguments from their own perspective as well as from the perspectives of their peers and the author. (HOD)

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IMPLICATIONS OF SCHEMA THEORY FOR THE TEACHING OF CRITICAL READING TO GIFTED ELEMENTARY STUDENTS

By

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INTRODUCTION

Although general intellectual ability as well as specific aspects of intelligence tests correlate with a student's ability to engage in critical thought and critical reading processes (Glaser, 1941; Burt, 1911), and although studies have shown that children of higher intelligence benefit more from instruction in critical thinking/reading tasks than do their peers (Glaser, 1941; Wolf, 1968), general intelligence may be only one contributing factor in a child's ability to perform on critical reading tasks asked of him/her. In fact, general intelligence may tap other abilities than the ability to think critically. As Watson-Glaser state (1964):

> ...a high level of 'intelligence' as measured by convenient tests may be necessary, but not sufficient, for high attainment in critical thinking (p. 10).

The way in which an individual thinks, his/her ability to critically weigh conflicting ideas and make balanced decisions concerning issues under scrutinization, is a reflection of that individual's intelligence plus other contributing factors. As Osborne (1939) concludes in his research study on students' resistance to propaganda:

> ...While the possession of knowledge and intelligence is no doubt necessary in order to do critical thinking...an individual may, according to commonly attained measures, possess both these traits to a high degree and yet be highly susceptible to propaganda influences (p. 16).

As most gifted children are a reflection of high ability as well as achievement (Witty, 1958), other factors such as the suspension of

"quick judgment" (Bloom, 1971) and/or the ability of seeing and defining a problem from a different perspective (Andersor, 1977) may interfere with a gifted child's ability to think and read critically.

THE RELATIONSHIP OF SCHEMA THEORY TO THE READING PROCESS

Rooted in the theoretical conceptualization that the reader imposes a high-level organizational structure upon textual material and interprets any written passage dependent upon his/her experiential background interacting with the data or stimulus of the printed page, schema theory provides the "cognitive scientist" with a cognitive processing framework for understanding the elaborate process by which a reader selectively perceives, comprehends, and interprets textual material (Anderson, 1977). Unlike the traditional psychological perspective which suggests that all behavior, including reading behaviors, can be understood as "concatenations of simple units" (p. 417) and that stimuli "evoke" or directly "control" the responses of a reader, schema theory suggests that the reader's complex "theory of the world" (Smith, F., 1975) and the schematic representations inherent in that "theory" directly influence the way in which he/she organizes the information presented in the textual material and the way in which the reader extrapolates meaning from that material.

In contrast to the "bottom-up" or "data driven" analysis and conceptualization of the reading process (Anderson, 1977; p. 5) in which passage meaning elaborates itself in a linear progression from the perception and analysis of oblique lines and squibbles in the formation of letters to the morphological identification of words and, finally to the semantic understanding of textual material through the summative influences of individual sentence meanings, schema theory argues that the linkage of simple behaviors in a hierarchial order, from the lowest to highest or more complex order, cannot and does not

fully account for the way in which reading material is selectively accessed by the reader. Schema theory also suggests that a bottom-up process to interpreting printed material cannot fully account for the way in which new experiences encountered within the context of the printed page are assimilated into the reader's increasingly complex knowledge system's repretoire. In fact, bottom-up analysis or use of a "data driven" approach for programming computers to solve any but the simpliest of problems proved ineffective. As Anderson (1977) states in his discussion of the empiricists fruitless attempts to program computers through a data driven approach:

> It proved necessary to provide computers
> with rather elaborate knowledge of the world
> to get them to recognize simple objects (p. 417).

Likewise, the reader's "elaborate knowledge of the world" influences his/her reading behaviors. While emphasizing a top-down conceptual model of the reading process, yet not excluding the interacting and contributing influence and effect that a bottom-up analysis of textual data has upon interpretive meaning, schema theory provides a "conceptually driven" rationale for interpreting printed material (Anderson, 1977; p. 5). According to the thrust of this approach, the reader samples printed material to confirm or reject generated hypotheses as to the content meaning of the reading selection based upon the reader's existing patterns of knowledge or schematic representations relevant to passage content. Comprehension of a message occurs when a "coherent formulation" of its contents has been established (p. 4). Conceptualization and elaboration of this notion as well as the influence that a person's

evoked schema will have upon the interpretation of a prose selection was illustrated by a research study conducted by Anderson et. al. (1977) in which thirty physical education students and thirty music education students were asked to interpret meaning from the presentation and reading of two ambiguous passages. Following the reading, vocabulary and recall tasks, subjects were asked to respond to ten multiple choice questions, each question having two correct responses, dependent upon the subject's interpretation of the passage. Debriefing questionnaires and autobiographical inventories, written to tap interests related to the interpretation of the selections were presented to the students following questioning procedures. Results of the study showed that:

1. Subjects interpreted ambiguous passages more consistently with their specific backgrounds of experiences;
2. Most subjects gave each passage one distinct interpretation;
3. Subjects gave more correct and consistent answers on passages reflective of their background of experience:
   a. Physical education majors gave more correct wrestling consistent answers than music students on the Prison/Wrestling test,
   b. Music education majors gave more correct music consistent answers than wrestling students on the Card/Music test;
4. The interpretation of a given message is directly influenced by the person's background:
   a. Sixty-two percent of the subjects were never aware of a second possible interpretation of the selected passage,
   b. Twenty percent of the subjects were aware of an alternative interpretation of the message only when presented with the multiple-choice testing situation, and
   c. Less than twenty-three percent of the subjects were aware of a second possible interpretation of the selection during the initial reading.

The results of Anderson's study suggests that prior knowledge and personal interest influence and bias a person's interpretation of contextual written material during the actual reading process. Accordingly, Anderson's "schema theory" suggests that:

> ...(the) principle determinant of knowledge a person can acquire from reading is the knowledge...(that)...he/she already possesses (p. 378).

Anderson as well as Wyer (1977) suggest that information processing resulting in the creation of cognitive dissonance will be resisted by the reader when a major cognitive restructuring of schematic representation must take place and the reader's underlying belief system is consequently jeopardized. Under these conditions, it is easier for the reader to "segregate logically incompatible schemata" (Anderson, 1977; p. 429) than to change or accommodate high-level schemata to support conflicting data collection and assimilation of this data into existing incongruent high-level schemata representations.

As an interactive balance between a top-down and bottom-up approach to the reading process provides a more substantiated and supportive model for the process by which meaning is accessed from textual material (Rumelhart and Ortony, 1977) the remainder of the paper will focus upon the influencing effects that the processes of ideational scaffolding and perspective shift have upon the practice of teaching critical reading to gifted elementary students.

THE INFLUENCE OF SCHEMA THEORY ON THE CRITICAL READING PROCESS

Fundamental to any critical reading process is the ability of the child to recognize and identify assumptions (Glaser, 1941) concerning the world in which he/she lives and brings to the printed page. The ability to recognize one's own assumptions as well as those assumptions inherent in the author's presentation of a reading selection is as complex as its definition appears simple. Raths (1967) defines an assumption as "something that is taken for granted" (p. 12). The Los Angeles Unified School District (1975), in developing its programs for the gifted, added some complexity to the definition by asserting that an assumption is:

> ...an explicit or implicit understanding which is used in a line of reasoning...assumption(s) refer to any assertion(s) which are "unproved" (by the reading selection) or taken for granted (p. vii).

As such, assumptions operate in "every situation where a conclusion is made" (p. 13; Raths, 1967). If, when buying a piece of clothing, we must choose between two very similar pieces of merchandise, we use our knowledge of merchandising, customer relations and consumer protection laws to provide the basis for one decision that we must make. Yet, underlying this knowledge system and subsumed within this system are some basic assumptions which we are bringing to bear on the decision-making process in which we are involved. We may assume that the manufacturing house is a reputable firm whose integrity establishes the worthiness and quality of the product which is being marketed. We may assume that the saleslady, offering the merchandise for our consumption, is an informed, unbiased and experienced professional in her business and offers us the best as well as most objective consumer advice regarding the product under consideration for purchasing. We may even assume that the words, phrases and comments made

during the sales transaction have a somewhat identical interpretation by both the sender and receiver of the verbal and nonverbal messages. In this way, assumptions operate as gap-fillers in one's knowledge system (Ennis, 1962); or as Raths (1967) suggests:

> Assumptions represent gaps in what would constitute proof;...they are the things which we take for granted when we accept the conclusion (p. 13).

Yet, the relative validity of any one of these assumptions is dependent upon the particular situation to which it is tied and the perspective which is taken during the decision-making process.

Viewed from the perspective that assumptions can be "unconscious and implicit understandings" that a reader as well as an author hold about the nature of the world in which they live (Watson-Glaser, 1964; Ennis, 1962), assumptions can fill the slots of developing mental schemata (Anderson, 1977) and/or become embedded and subsumed in pre-existing schematic representations (Ausubel, 1968). As the mental schematas of the child may be quite different from those which serve the author, the function of the reader in critically analyzing a passage becomes two-fold. He/She must 1) bring into a conscious awareness the pattern of elements which from his/her own mental schematas in relationship to the passage being read and 2) he/she must suspend his/her own evaluative judgmental role as he/she objectively views the passage from another's perspective--that being the perspective of the author. Knowing that the author carries with him/her a personal set of assumptions about the world in which he/she lives and which serve to form part of the foundation of his/her own schematic representations a...

knowing that the perspective of the reader and the perspective of the author may be quite divergent, the critical reader, in interpreting any reading selection, is furthered hindered by the limitations imposed upon him by the development of his own high-level, schemata representations (Anderson, 1977). As text information is "interpreted, organized, and retrieved in terms of high-level schemata" (p. 22; Anderson, 1977), the skill needed to unconsciously shift perspective when reading a selection may not be present even in the most mature reader.

In a study to determine the role that schemata plays in the learning and remembering textual information, Anderson et. al. (1977) randomly assigned 75 undergraduate educational psychology students to the reading of either a restaurant or supermarket narrative script. Prior to the construction of each script, a norming study involving 37 subjects from the aforementioned population was run. In this study, each subject was asked to describe "the activities involved in dining at a fine restaurant" (p. 5). Their congruent responses served as the framework for developing the scripts used in the following investigation. Both the restaurant and narrative scripts mentioned eighteen food and beverage items fitting specific categories identified in the norming study. All items were mentioned in the identical order between scripts. The two passages involved the same actors, events and objects. Eleven idea units were presented in each script and were judged to have "equal significance from a supermarket or restaurant perspective" (p. 6).

Having been randomly assigned to read one of the two scripts, each of the 75 subjects was instructed to read the untimed selection carefully as a test would follow the reading. Administration of the Wide Range Vocabulary Test was given immediately following the reading and, subsequently, subjects were asked to reproduce, from memory, the passage that they had just completed reading as accurately as possible.

It was hypothesized by the investigators that dining at a fancy restaurant provides more schematic structure on the events occurring at the restaurant than those occurring at a supermarket; therefore, subjects reading the restaurant script would:

1) Recall the eighteen food items more accurately than the supermarket script group.
2) Attribute food items to specific character identification more accurately; and,
3) Recall food items in the order in which they were mentioned more accurately.

Results of the study showed that while "...people of higher verbal ability tended to do better, verbal ability was never a significant main effect, nor did it enter into any significant interactions" (p. 7). Specific results bearing upon the hypotheses statements showed that subjects who received the restaurant script:

1) Recalled, on the average, more items of food and recalled significantly more food items defined as occurring in a "high probability category of food" for a restaurant schema as opposed to the "low probability category".
2) Attributed more food items, on the average, to the correct character within the script.
3) Yet, failed to recall, at a significant higher rate, the exact order of food item presentation.

As was expected, recall of identical propositions set forth in both passages and judged to be equally as important to both, showed no significant differences between the two groups. Anderson's study adds further evidence that the development of a reader's high-level schema is precipitated by certain assumptive propositions. The resulting high-level schematic representations which the readers takes with him/her to the printed page will have a direct influence upon the way in which the passage will be organized and interpreted. Specifically, high-level schema provides the basis for "ideational scaffolding" of the textual information (Anderson, 1977).

Armed with a high-level schema, the reader fills slots in his/her schema with factual or "inferential reconstructed" information from the text which aligns itself with the reader's existing schema (Spiro, 1977). Thus, the reader selectively perceives the elements of information to be encoded from the text, dependent upon the categories available to him/her within his/her pre-existing schema structures. As has been stated previously, underlying this entire process are certain implicit assumptive propositions that the reader makes whenever he/she establishes categories within developing schema, fills those categories with slotted information, and consequently, interprets the passage and acts upon her/his interpretation from the perspective of this schematic organization.

IMPLICATIONS OF SCHEMA THEORY FOR THE TEACHING OF CRITICAL READING TO GIFTED ELEMENTARY STUDENTS

In teaching critical reading to students, especially to a gifted population of students whose development of high-level schemas may occur earlier than their peers, it becomes imperative that critical reading skills be taught at an early age before these high-level schema are formed and brought to bear on the printed page. Once high-level schema have developed, it would seem increasingly more difficult to change existing schematic representations (Wyer, 1977) or provide for the flexibility of thought needed to access other possible interpretations of the same passage. As was witnessed by Anderson and Pichert's study (1978). introductory educational psychology students asked to recall elements of a story from differing perspectives related significantly different information to the examiner depending upon the prespective with which they were asked to identify. It was hypothesized by this

study's investigators that the retrieval mechanisms activating recall of information from prose material are "distinct from storage mechanisms" (p. 4)... It was further hypothesized that retrieval and recall of significant and relevant information from a reading passage is dependent upon the perspective of the reader; and, when a perspective shift is requested of a person by an external agent, additional recall of information relevant to the new perspective would be elicited while recall of information relevant to the initial assignment of perspective would diminish. Thirty-nine introductory educational psychology students participated in the experiment. Half of the subjects were requested to read a selection from the perspective of a burgler; the other half were instructed to read the selection from the perspective of a future home owner. Both groups were instructed to read for the purpose of remembering the ideas contained within the story. Following a two minute silent reading period of time, all students were administered the Wide Range Vocabulary Test and subsequently requested to "...write down as much of the exact story as you can on...two sheets of paper..." (p. 5). Following administration of another five minute test, students were asked to again recall the story which they had initially read. This time, half of the subjects were asked to recall the reading selection from a different perspective. Following the second recall, debriefing questionnaires were completed by all subjects. Results of this study as well as a replication study involving sixteen introductory psychological studnets, each of which were asked to switch perspective on the second recall task, indicated that:

1. People who change perspectives recall more information important to the second perspective but unimportant to the first;
2. People who shift perspective will recall less

information that is unimportant to the new perspective. (Not a significant difference in this study).

3. Interview protocals from the second experiment suggest that "...readers selectively attent to elements of a story that are significant in terms of an operative perspective" (Anderson and Pichert, 1977; p. 10).

Implications of this study suggest that a student can make a perspective shift when asked to do so, yet the automaticity of this shift will not occur spontaneously when students are presented with a prose selection. Whereas information from the passage seems to be encoded to fit slots of many differing schemata representations of the student, retrieval of initial information in a recall setting is dependent upon the "ideational scaffolding" occurring on the basis of the child's high-level schema. Thus, the role of the teacher in developing the critical reading skills of his/her students whould involve the development of an instructional setting in which students become consciously aware of the assumptions underlying the mental schemas operating upon the student's organization and interpretation of the textual presentation of information. The instructional setting should also provide a structure in which a shift in perspective can be analyzed for its merits as well as the nature of the assumptions forming the foundation of its characterization. Although the advanced organizer (Ausubel, 1968) lacks credibility as an instructional tool for triggering conscious retrieval of a relevant schema or for acquiring necessary applicable schema (Anderson, 1977) when the student does not possess the appropriate, subsuming structures, the use of an externally-based, student-centered outline format may facilitate the conscious uncovering of implicit assumptions used in a line of reasoning while providing a structure in which students can analyze biasing and emotionally-loaded statements and arguments from their own perspective as well as the perspectives of their peers and the perspective of the author.

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